

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
MDS OPERATIONS, INC.	)	Call Sign WQAR561, MVD049 -
	)	Albuquerque-Santa Fe, New Mexico
Request for Waiver of Certain Multichannel Video	)	
Distribution and Data Service Technical Rules for	)	WT Docket No. 07-255
One Station in Sandia Park, New Mexico	)	

**ORDER**

**Adopted: June 21, 2010**

**Released: June 22, 2010**

By the Chief, Wireless Telecommunications Bureau:

**I. INTRODUCTION**

1. In this *Order*, we address a Superseding Waiver Request filed by MDS Operations, Inc. (MDS Operations), to operate a Multichannel Video Distribution and Data Service (MVDDS) station above the permissible power limits at a single site in Sandia Park, New Mexico. Because the site is uniquely situated, we grant the Superseding Waiver Request, in part, subject to the conditions adopted herein. Granting this relief will encourage the deployment of MVDDS service.

**II. BACKGROUND**

2. MVDDS is a fixed wireless terrestrial service at 12.2-12.7 GHz that may be used to provide one-way digital fixed non-broadcast service, including one-way direct-to-home/office wireless service.<sup>1</sup> MVDDS is authorized on a co-primary, non-harmful interference basis with incumbent Direct Satellite Services (DBS) providers and on a co-primary basis with non-geostationary satellite orbit fixed-satellite service (NGSO FSS) stations.<sup>2</sup> MVDDS is licensed on a geographic area basis according to Nielsen's 2002 Designated Market Areas and several FCC-defined areas.<sup>3</sup>

<sup>1</sup> See 47 C.F.R. § 101.1407 (two way services can be provided using spectrum in other bands for the return link).

<sup>2</sup> See, e.g., Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, ET Docket No. 98-206, *First Report and Order and Further Notice of Proposed Rule Making*, 16 FCC Rcd 4096, 4099-4100 ¶ 2 (2000) (*First R&O*); see also 47 C.F.R. § 2.106.

<sup>3</sup> See 47 C.F.R. § 101.1401. Designated Market Area (DMA®) is a registered trademark of Nielsen Media Research, Inc. (Nielsen). Although Nielsen revises DMAs periodically, the MVDDS license areas remain fixed to the boundaries of the 2002 DMAs. To avoid confusion with Nielsen's current DMAs, MVDDS license areas are designated as "MVDs" in the Universal Licensing System.

3. The Commission adopted rules for MVDDS based on the extensive record of the rule-making proceeding,<sup>4</sup> which included a congressionally mandated independent analysis<sup>5</sup> of potential MVDDS interference to DBS.<sup>6</sup> These rules include detailed frequency coordination procedures, interference protection criteria, and limitations on signal emissions, transmitter power levels, and transmitter locations.<sup>7</sup> Of particular relevance to the instant waiver request, the rules limit the effective isotropic radiated power (EIRP) for MVDDS stations to 14.0 dBm per 24 megahertz (−16.0 dBW per 24 megahertz).<sup>8</sup> To accommodate co-primary DBS earth stations, an MVDDS licensee shall not begin operation unless it can ensure that the equivalent power flux density (EPFD)<sup>9</sup> from a proposed transmitting antenna does not exceed the applicable<sup>10</sup> EPFD limit at any DBS subscriber location.<sup>11</sup> Also, the MVDDS licensee must satisfy all complaints of interference to DBS customers of record during a one year period after commencement of operation of the transmitting facility.<sup>12</sup>

4. The Commission found that these and the other technical requirements would ensure that any interference caused to DBS customers will not exceed a level that is considered permissible.<sup>13</sup> However, the Commission also contemplated that MVDDS service providers might petition for waiver(s) of the

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<sup>4</sup> See Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operations of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band with Frequency Range; Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; and Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide A Fixed Service in the 12.2-12.7 GHz Band, *Memorandum Opinion and Order and Second Report and Order*, ET Docket No. 98-206, 17 FCC Rcd 9614 (2002) (*Second R&O*).

<sup>5</sup> See Prevention of Interference to Direct Broadcast Satellite Services, Pub. L. No. 106-553, App. B. Tit. X, § 1012(a), 114 Stat. 2762, 2762A-128, 2762A-141 (2000) (LOCAL TV Act).

<sup>6</sup> See, e.g., *Second R&O*, 17 FCC Rcd at 9635 ¶ 56 (citing MITRE Corporation, "Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band" (Apr. 18, 2001) (MITRE Report)).

<sup>7</sup> See, e.g., *Second R&O*, 17 FCC Rcd at 9634-9664 ¶¶ 53-125; 9690-9695 ¶¶ 196-209; 47 C.F.R. §§ 25.139 (NGSO FSS coordination and information sharing between MVDDS licensees in the 12.2 GHz to 12.7 GHz band); 25.208(k) (Power flux density limits); 101.103 (Frequency coordination procedures); 101.105 (Interference protection criteria); 101.111 (Emission limitations); 101.113 (Transmitter power limitations); 101.129 (Transmitter location); 101.1409 (Treatment of incumbent licensees); 101.1440 (MVDDS protection of DBS).

<sup>8</sup> See 47 C.F.R. §§ 101.113(a) note 11; 101.147(p). The EIRP limit for MVDDS is expressed as a power spectral density, i.e., 14 dBm per 24 megahertz of spectrum. Herein we occasionally refer to EIRP levels in shorthand, e.g., "14 dBm." We clarify that these shorthand references are for convenience only.

<sup>9</sup> The EPFD is the power flux density produced at a DBS receive earth station, taking into account shielding effects and the off-axis discrimination of the receiving antenna assumed to be pointing at the appropriate DBS satellite(s) from the transmitting antenna of a MVDDS transmit station. 47 C.F.R. § 101.105(a)(4)(ii)(A).

<sup>10</sup> The Commission established different EPFD limits in four regions of the U.S., see 47 C.F.R. § 101.105(a)(4)(ii)(B), mainly due to differences in rainfall in each region. See, e.g., *Second R&O*, 17 FCC Rcd at 9691 ¶ 197.

<sup>11</sup> See 47 C.F.R. § 101.105(a)(4)(ii) (referencing the procedures listed in 47 C.F.R. § 101.1440). Among other things, an MVDDS licensee must conduct a survey of the area around its proposed transmitting antenna site to determine the location of all DBS customers of record that may potentially be affected by the introduction of its MVDDS service and must coordinate with DBS. See 47 C.F.R. § 101.1440(a)-(d).

<sup>12</sup> See 47 C.F.R. § 101.1440(g) (the MVDDS licensee must correct interference caused to a DBS customer of record or cease operation if it is demonstrated that the DBS customer is receiving harmful interference from the MVDDS system or that the MVDDS signal exceeds the permitted EPFD level at the DBS customer location); see also *Second R&O*, 17 FCC Rcd at 9642 ¶ 68.

<sup>13</sup> See, e.g., *Second R&O*, 17 FCC Rcd at 9640-9663 ¶¶ 67-125; 9691-9692 ¶ 198; see also 47 C.F.R. Part 2 (defining harmful interference).

technical rules,<sup>14</sup> and stated that the petitioning party must “submit an independent technical demonstration of its equipment and technology.”<sup>15</sup> In denying petitions to reconsider the power limits,<sup>16</sup> the Commission reiterated that MVDDS providers may seek waivers of the general MVDDS limits.<sup>17</sup>

5. *Waiver Request.* On May 7, 2007, MDS Operations<sup>18</sup> filed a waiver request seeking authority to operate at EIRP levels up to 40 dBm per 24 megahertz of spectrum, *i.e.*, 400 times stronger than allowed, in each of its 80 licensed service areas.<sup>19</sup> In support, MDS Operations included a test report concerning an experimental MVDDS operation at a site in Sandia, Park, New Mexico (Sandia Park site) and field measurements taken at various locations in Albuquerque, New Mexico.<sup>20</sup> On November 9, 2007, the Wireless Telecommunications Bureau (Bureau) sought comment on the Waiver Request<sup>21</sup> and we received comments and oppositions filed by DBS operators,<sup>22</sup> to which MDS Operations filed reply comments.<sup>23</sup> In particular, the DBS operators objected to MDS Operations’ reliance on the Test Report to support a request for a blanket waiver of the EIRP limits for MVDDS stations across all 80 of its licensed service areas.<sup>24</sup> However, MDS Operations subsequently limited its request to operation at the Sandia Park, New Mexico site, thereby rendering this objection moot.

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<sup>14</sup> See *Second R&O*, 17 FCC Rcd at 9704 ¶ 236. The Commission stated that it would seek public comment on such waiver requests. *Id.*

<sup>15</sup> *Second R&O*, 17 FCC Rcd at 9704 ¶ 236. The Commission adopted this independent testing requirement to ensure that terrestrial services deployed in this band would not cause harmful interference to existing operations in accordance with Section 1012(a) of the LOCAL TV Act while still allowing the flexible use of the spectrum without limiting current and future innovations for terrestrial deployment of wireless technologies in this band. *Second R&O*, 17 FCC Rcd at 9704 ¶ 236.

<sup>16</sup> See Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, ET Docket No. 98-206, *Fourth Memorandum Opinion and Order*, 18 FCC Rcd 8428, 8468-8469 ¶¶ 86-88 (2003) (*Fourth MO&O*).

<sup>17</sup> See *Fourth MO&O*, 18 FCC Rcd at 8469 ¶¶ 87-88.

<sup>18</sup> MDS Operations is the licensee of 80 Multichannel Video Distribution and Data Service (MVDDS) licenses including call sign WQAR561, Albuquerque-Santa Fe, New Mexico.

<sup>19</sup> See MDS Operations, Inc., Petition for Rule Waiver (May 7, 2007); MDS Operations, Inc., Supplement to Petition for Rule Waiver (Aug. 29, 2007). MDS Operations holds 80 MVDDS licenses for which it was the winning bidder in Auctions 53 and 63.

<sup>20</sup> See MDS Operations, Inc., Petition for Rule Waiver, Exhibit One: Albuquerque MVDDS Test Report (May 7, 2007) (Test Report). The Sandia Park, New Mexico site is in the Albuquerque-Santa Fe MVD. MDS Operations explained that MDS America, an affiliate, obtained an experimental special temporary authority (STA) under call sign WC9XKW and that the testing was conducted in the Albuquerque-Santa Fe MVD from September 14, 2006, through October 9, 2006.

<sup>21</sup> Wireless Telecommunications Bureau Seeks Comment on Petition of MDS Operations, Inc. for Waiver of Multichannel Video Distribution and Data Service Technical Rules, *Public Notice*, WT Docket No. 07-255, 22 FCC Rcd 19446 (WTB BD 2007) (*Public Notice*).

<sup>22</sup> DIRECTV, Inc., Opposition (Dec. 19, 2007) (DIRECTV 2007 Opposition); EchoStar Satellite L.L.C., Opposition (Dec. 19, 2007) (EchoStar Opposition); see also Linda Kinney, Vice President, Law and Regulation, DISH Network Corporation, to Marlene H. Dortch, FCC, WT Docket No. 07-255 (May 16, 2008) (DISH Network Letter).

<sup>23</sup> MDS Operations, Inc. Reply Comments (Jan. 18, 2008) (MDS Operations Reply Comments). MDS Operations, DIRECTV, and DISH Network Corporation, which was spun-off from the EchoStar Corporation effective January 1, 2008, also submitted *ex parte* filings in the docketed proceeding, WT Docket 07-255.

<sup>24</sup> See, e.g., DIRECTV 2007 Opposition at 9-13; EchoStar Opposition at 2; DISH Network Letter at 2.

6. *Superseding Waiver Request.* On June 25, 2009, MDS Operations filed the Superseding Waiver Request, which narrows the waiver request to one transmitting antenna at the Sandia Park site<sup>25</sup> at an EIRP up to 36 dBm per 24 megahertz of spectrum “in light of technical and interference findings that are unique” to the Albuquerque-Santa Fe market.<sup>26</sup> MDS Operations contends that its proposed operation would result in a more economical and efficient MVDDS service without causing harmful interference to other uses of the 12.2-12.7 GHz band.<sup>27</sup> MDS Operations states that it is not seeking waiver of, and would meet, the EPFD limit<sup>28</sup> as well as the prior coordination requirements with DBS and NGSO FSS.<sup>29</sup> The Superseding Waiver Request specifically amends and supersedes the earlier request but incorporates by reference the Test Report.<sup>30</sup>

7. According to MDS Operations, the Test Report presents the results and analysis (including any impact on DBS operations),<sup>31</sup> of MVDDS operations at the Sandia Park site at EIRP levels higher than permitted under the rules. MDS Operations states that Dr. Bahman Badipour of Analytic Consulting Services (ACS) designed the test procedure and protocols and conducted field tests under the experimental STA in Albuquerque, New Mexico.<sup>32</sup> MDS Operations contends that ACS studied the effects of MVDDS transmissions at varying power levels on the receipt of DBS signals using equipment comparable to that used by DBS customers in Albuquerque, including three types of receive antennas.<sup>33</sup> MDS Operations states that notice of the field tests was given to DBS operators and the local media and that no complaints of harmful interference to DBS were received.<sup>34</sup> MDS Operations asserts that the testing demonstrates that high power operations “resulted in little difference in the detection of MVDDS signals at the DBS receivers, and, detection of MVDDS signals did not correlate to actual harmful interference.”<sup>35</sup>

8. MDS Operations avers that the purpose of the EIRP limit is to protect DBS receivers from harmful interference and degradation of service without unduly constraining the deployment of MVDDS.<sup>36</sup> MDS Operations notes that the Commission’s “very conservative technical parameters” work to constrain MVDDS deployment because MVDDS licensees must build out more transmitters across

<sup>25</sup> See *MDS Operations, Inc., Superseding Petition for Rule Waiver (June 25, 2009) (Superseding Waiver Request)* at 1-3.

<sup>26</sup> Superseding Waiver Request at 2. MDS Operations specifically requested a waiver of 47 C.F.R. § 101.147(p) which limits EIRP “for MVDDS stations to 14 dBm per 24 MHz of spectrum, and relevant portions of any related MVDDS rules to the extent necessary to allow operation of Station WQAR561 in the Albuquerque-Santa Fe Designated Market Area at higher power levels than what the Rules currently authorize.” Superseding Waiver Request at 1.

<sup>27</sup> Superseding Waiver Request 1-3.

<sup>28</sup> “To the extent it is unclear from prior filings . . . MDSO clarifies [in the Superseding Waiver Request] that it is not seeking a waiver of the [EPFD] limits.” Superseding Waiver Request at 2.

<sup>29</sup> See Superseding Waiver Request at 3, 17-19.

<sup>30</sup> Superseding Waiver Request at 2.

<sup>31</sup> Superseding Waiver Request at 4. MDS Operations notes that MDS America was granted an earlier experimental license in 2001 to conduct studies “to demonstrate to the Commission the ability to operate in MVDDS spectrum without causing harmful interference to other users of the subject spectrum bands.” *Id.*

<sup>32</sup> Superseding Waiver Request at 4.

<sup>33</sup> *Id.* at 4-5.

<sup>34</sup> *Id.* at 5.

<sup>35</sup> *Id.*

<sup>36</sup> *Id.* (citing *Second R&O*, 17 FCC Rcd at 9641-42 ¶¶ 68-69).

each individual service area due to the low power at which each transmitter must operate.<sup>37</sup> MDS Operations contends that the Test Report demonstrates that a well-designed MVDDS system can operate at power levels well above the maximum EIRP generally permitted by the Commission's Rules without negative impact on DBS reception.<sup>38</sup> MDS Operations asserts that because its proposed system can utilize higher EIRP levels without detriment to DBS operations, grant of the Superseding Waiver Request will not undermine the purpose of the EIRP limit and will in fact promote the rapid, flexible deployment of MVDDS services in furtherance of the public interest.<sup>39</sup>

9. On September 1, 2009, DIRECTV opposed the Superseding Waiver Request arguing, among other things, that the revisions to the proposed EIRP power limits submitted by MDS Operations in the Superseding Waiver Request will not sufficiently protect DBS subscribers.<sup>40</sup>

### III. DISCUSSION

10. Pursuant to Section 1.925 of the Commission's Rules, we may grant a waiver if it is shown that either that either (1) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest; or (2) in view of the unique or unusual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.<sup>41</sup> As described above, an MVDDS licensee seeking waiver of the technical rules must "submit an independent technical demonstration of its equipment and technology."<sup>42</sup>

11. The Commission adopted the 14 dBm limit, as recommended by the MITRE Report,<sup>43</sup> as a "compromise between our [earlier] proposed limit of 12.5 dBm generally and higher power allowed under certain circumstances."<sup>44</sup> The Commission explained that the general EIRP limit, as well as the EPFD limits, needed to be sufficiently conservative to ensure that any potential interference to DBS is held below any level that could be considered harmful under the rules.<sup>45</sup> Regarding the EIRP limit, the Commission further explained that:

[P]lacing a limit on MVDDS EIRP will ensure that DBS entities are not unduly hindered in their ability to acquire customers in areas in close proximity to MVDDS transmit facilities. Thus, we are not permitting higher powers over areas containing mountain ridges or over presently unpopulated regions because the higher power may cause too great of an exclusion zone for future DBS and NGSO FSS subscribers. We recognize that a higher power benefit for MVDDS providers would not offset the potential constraints placed on other service subscribers in the 12 GHz band.<sup>46</sup>

<sup>37</sup> Superseding Waiver Request at 6 (*quoting Second R&O*, 17 FCC Rcd at 9642 ¶ 71).

<sup>38</sup> Superseding Waiver Request at 6.

<sup>39</sup> *Id.* at 6-7.

<sup>40</sup> DIRECTV, Inc., Opposition to Superseding Waiver Request (filed Sept. 1, 2009) (DIRECTV 2009 Opposition).

<sup>41</sup> 47 C.F.R. § 1.925(b)(3); *see also WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

<sup>42</sup> *See* note 15 and accompanying text, *supra*.

<sup>43</sup> *See* note 6, *supra*.

<sup>44</sup> *Second R&O*, 17 FCC Rcd at 9691-92 ¶ 198.

<sup>45</sup> *See Fourth MO&O*, 18 FCC Rcd at 8469 ¶ 87.

<sup>46</sup> *Second R&O*, 17 FCC Rcd at 9691-92 ¶ 198; *see also* DIRECTV Opposition to Superseding Waiver Request at 3-4.



12. DIRECTV asserts that the Superseding Waiver Request should be rejected for raising proposals that were rejected in the rulemaking proceeding wherein, among other things, the Commission denied MDS America's petition seeking reconsideration of the general EIRP limit in rural areas.<sup>47</sup> We disagree. Although the instant request includes references to future operations beyond the Sandia Park site that could suggest a request for general relief,<sup>48</sup> we read the Superseding Waiver Request to seek relief for a single MVDDS station based on the unique attributes of the Sandia Park site (and our action today delimits the scope of the relief granted accordingly).<sup>49</sup> Furthermore, in denying MDS America's reconsideration petition, the Commission reiterated that individual MVDDS operators may seek waiver of the technical rules and emphasized that it was not prejudging whether an MVDDS licensee may be able to demonstrate that a waiver of the EIRP and EPFD limits may have some technical merit in certain very specific circumstances.<sup>50</sup>

13. Turning to the Superseding Waiver Request, we find that the Sandia Park site is uniquely situated and that limited relief can be granted. As DIRECTV noted in explaining why the testing in Albuquerque in no way reflected the "worst case" scenario and certainly could not be applied in other markets, "the [Sandia Park] test site offers the unique geographical advantage of a nearby mountain upon which to place the MVDDS transmitter. This topography affords a relatively isolated area from which to provide service targeting a relatively distant urban market and the surrounding suburbs."<sup>51</sup> Put differently, while the Sandia Park site provides an excellent line-of-sight propagation path into fairly populated areas in or near Albuquerque, the highest power fields (those nearest the transmitter) will occur over an unpopulated—mostly uninhabitable—mountain side for the first 3.49 kilometers (2.17 miles).<sup>52</sup> Given these unique circumstances,<sup>53</sup> we are persuaded that an MVDDS station serving Albuquerque from the Sandia Park site can operate at an EIRP level above the general limit without increasing harmful

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<sup>47</sup> See DIRECTV Opposition to Superseding Waiver Request at 8-9 (*citing Fourth MO&O*, 18 FCC Rcd at 8469 ¶ 87); see also EchoStar Opposition at 4-5. In the MVDDS proceeding, MDS America petitioned for reconsideration to allow 39 dBm in rural areas stating a transmitter relatively high above the surrounding terrain with the antenna beam shaped and pointed would not cause harmful interference to nearby DBS receivers because the MVDDS signal would not illuminate the ground within a significant zone around each MVDDS transmitter. See *Fourth MO&O*, 18 FCC Rcd at 8468-8469 n. 232.

<sup>48</sup> DIRECTV Opposition to Superseding Waiver Request at 7-8 ("At various points in its Superseding Petition, MDSO indicates that its waiver request (as now modified) would apply only to operation 'from a single transmitter that will provide coverage throughout the Albuquerque area.' Yet at many other points in that same filing, MDSO indicates that it intends to deploy additional transmitters in this market.").

<sup>49</sup> See, e.g., note 26, *supra*.

<sup>50</sup> See *Fourth MO&O*, 18 FCC Rcd at 8469 ¶¶ 87-88.

<sup>51</sup> DIRECTV April 2008 Letter at 3-4; see also DIRECTV 2009 Opposition at 8 ("the topographical and geographic characteristics of Albuquerque are unique"); EchoStar Opposition at 2-3 (noted that Albuquerque is a non-representative market); DISH Network Letter at 2.

<sup>52</sup> See Superseding Waiver Request at 13, 16.

<sup>53</sup> As noted above, the Superseding Waiver Request renders moot issues concerning the applicability of the Test Report beyond the Sandia Park site. Nonetheless, in finding the Sandia Park site to be unique, we disagree with any suggestion that the Albuquerque-Santa Fe MVD presents "the most challenging spectrum environment" in which to assess interference to DBS due to factors such as the dry climate. See, e.g., Superseding Waiver Request at 16; MDS Operations Reply Comments at 1 (noting that, "[a]mong other factors, the dry climate ensured that there would be no attenuation of . . . [the] signal due to climatic conditions. . ."). To the contrary, such a climate is ideal because it minimizes degradation of DBS signals due to rain fade. See, e.g., DIRECTV April 2008 Letter at 3-5; DISH Network Letter at 2; EchoStar Opposition at 2 ("a single study in a dry area of the country is a poor choice to evaluate interference effects on a rain-sensitive DBS service [in 80 markets]").

interference to DBS. However, as explained below, we find MDS Operations' claim that the Test Report supports authorizing an EIRP level up to 36 dBm to be unpersuasive.

14. We note that nearly all of the "average" measurements recorded (for MVDDS transmitter power ranging from 27-43.7 dBm) greatly exceeded the  $-171.0 \text{ dBW/m}^2/4 \text{ kHz}$  EPFD limit.<sup>54</sup> Even though the Test Report exceeds 350 pages, it provides insufficient information concerning the measurements, methodology, and mitigation techniques used for us to assume that the MVDDS signal was reliably below the EPFD limit at each test DBS receiving antenna—much less that it would be so at each DBS subscriber's dish.<sup>55</sup> Indeed, while MDS Operation's consultant states that EPFD limits are the specific measure of interference protection criterion for co-primary DBS earth stations,<sup>56</sup> the Test Report addresses EPFD levels briefly and only indirectly by offering assumptions rather than actual EPFD measurements.<sup>57</sup>

15. The ideal case to reduce EPFD occurs when the MVDDS signal hits the back of the DBS dish and is thus reduced by the shielding effect of the dish causing negative gain or rejection. The Test Report claims to use a "worst case" scenario by assuming that the dish provides no protection but then assumes that a DBS dish antenna of 34 dBi gain would reduce the EPFD by 34 dBi (bringing the EPFD level below the limit).<sup>58</sup> The latter assumption is unreasonable. While the EPFD could be reduced by the total amount of antenna gain, it could also be reduced by less than the total gain, or increased if the MVDDS signal is coupled into the DBS receiver.<sup>59</sup> The gain or loss will result dependent upon the location of each DBS dish and other variables including the number of feeds on the DBS antenna.<sup>60</sup> However, if an MVDDS signal anywhere near the PFD levels listed in the Test Report misses the back of a DBS subscriber's dish and impacts on the feed horn, the EPFD will not be reduced to the limit the Commission set.

16. The Test Report, which MDS Operations had filed in support of its original request for an EIRP limit of 40 dBm throughout 80 markets and had incorporated by reference into the Superseding Waiver Request, concludes that "[i]t is the opinion of ACS that this system would co-exist with DBS

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<sup>54</sup> See Test Report, Tables 3 & 4. The Albuquerque-Santa Fe MVD is in the Southwestern region of the United States. 47 C.F.R. §§ 101.105(a)(4)(ii) establishes EPFD limits of  $-171.0 \text{ dBW/m}^2/4 \text{ kHz}$  in the Southwestern region.

<sup>55</sup> For example, the test results presented in the Test Report omit outlier data from the testing to the extent that any data point deviated from the mean by three times the standard deviation. See Test Report at 24. While it is not uncommon to impose a filter, the testing could have been conducted to collect and retain all of the data prior to filtering the data to eliminate significant deviations. In addition, the Test Report notes that "mitigation techniques" were used at specific test sites to make the presence of the MVDDS transmissions "virtually undetectable." See, e.g., Test Report at 30 (cross-referencing to Figs. 361-362 (data that does not include EPFD measurements, much less "before and after" EPFD measures showing the need for and efficacy of the mitigation technique) and Fig. 364 (photo of a DBS dish with square panels attached that roughly double the width of the dish)). It is unclear whether this was the only technique used; assuming, *arguendo* that it was, it is unclear whether variations in panel size or placement were used at other sites. We note that all of this information is significant to DBS operators, the Commission's staff, other MVDDS licensees, and equipment manufacturers.

<sup>56</sup> See MDS Operations Reply Comments, Exhibit One: Declaration of Dr. Bahman Badipour (Badipour Declaration) at 2.

<sup>57</sup> Tables 3 and 4 of the Test Report provide average PFDs but do not report the EPFDs into each DBS receiver model that was tested.

<sup>58</sup> See Test Report at 35.

<sup>59</sup> See, e.g., MITRE Report at 5-10.

<sup>60</sup> See, e.g., MITRE Report at 5-9; see also note 65, *infra*.

installations in the area with no meaningful interference to any of the existing DBS subscribers.”<sup>61</sup> But the Test Report also states that the “EIRP value associate [sic] with the detection threshold of  $-137.17\text{ dBW/m}^2/4\text{ kHz}$  based on [Test Report tables 3 and 4] is approximately 30 dBm, while the EIRP value based on [free space loss] model is 27 dBm.”<sup>62</sup> Given these statements, together with our concerns noted above, we find that MDS Operations has not established that an EIRP level up to 36 dBm, at the Sandia Park site, would not increase the potential for interference to DBS above the level that the Commission found permissible in the MVDDS rulemaking proceeding.

17. Our engineering analysis indicates that the unique circumstances offered by the Sandia Park site allow for an EIRP level up to 22 dBm—eight times stronger than generally allowed by the rule. In reaching this determination, we are allowing a higher EIRP from one station at the Sandia Park site at a level that provides roughly equivalent coverage relative to a hypothetical, multi-site system with transmitters in or near Albuquerque operating at 14 dBm EIRP (“compliant system”). This baseline approach provides reasonable assurance against an increase in interference into DBS receivers. A hypothetical system operating at 14 dBm EIRP with an antenna at 100 feet above ground level would generally provide reliable MVDDS service for a distance of approximately 10 kilometers. A compliant system serving most of Albuquerque could consist of four transmitter sites (located at the northeast, northwest, southeast, and southwest corners) each with an antenna at 100 feet above ground level directed toward the center of the city.

18. The Sandia Park site is located to the northeast of Albuquerque approximately 4 kilometers (2.5 miles) away from the hypothetical, northeast corner of the compliant, baseline system. Given this distance and utilizing free-space path loss, we calculate that a 6 dB power increase is warranted to permit the Sandia Park site to provide equivalent fields over the city relative to hypothetical northeast corner transmitter located 4 kilometers (2.5 miles) closer to the city. We further find that an additional power increase of 2 dB is justified to permit a single transmitting antenna at the Sandia Park site to provide coverage similar to that of a hypothetical, compliant system (operating with four transmitters at different locations at significantly lower heights) serving most of Albuquerque. Thus, we find that allowing a single transmitting antenna at the Sandia Park site to use, subject to conditions, up to an additional 8 dB EIRP (for a total EIRP limit of up to 22 dBm per 24 megahertz of spectrum), will not impermissibly increase the potential for interference to DBS. In this regard, we believe that the average PFDs reported in the Test Report for transmitter power ranging from 27-43.7 dBm<sup>63</sup> provide some degree of confidence that MDS Operations will be able to meet the  $-171.0\text{ dBW/m}^2/4\text{ kHz}$  EPFD limit, albeit with some mitigation, operating at an EIRP level up to 22 dBm at the Sandia Park site.<sup>64</sup>

19. In reviewing this matter, we also consider that DBS dishes are most likely to be pointed at satellites located at 101, 110, and 119 degrees West. As such, the most likely interference would occur along the path of 231 degrees true bearing from the Sandia Park site because MDS Operations’ power would most likely miss the back of the DBS reflector and possibly hit the feed horn from both the top and the side. Thus, if MDS Operations can satisfy the  $-171.0\text{ dBW/m}^2/4\text{ kHz}$  EPFD for DBS dishes located generally along this radial, then satisfying the EPFD limit as to DBS dishes located along other radials

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<sup>61</sup> Test Report at 36.

<sup>62</sup> Test Report at 35; *see also* DIRECTV 2009 Opposition at 2-3 (*citing* Badipour Declaration at ¶¶ 4 (operating at 30 dBm EIRP corresponds to the EPFD limit), 30 (“the EIRP value that met the EPFD limit in that test environment is 30 dBm”)).

<sup>63</sup> The receive sites were located in populated areas (relative to the mountainside) of Albuquerque at distances between 3.73 km and 37.69 km from the Sandia Park transmitter site. *See* Test Report at 20-22 (Figure 12 and Table 2).

<sup>64</sup> In all events, we note that MDS Operations states that it will comply with the EPFD limit if permitted to operate a single transmitter at the Sandia Park site at a higher level pursuant to a waiver. *See* Superseding Waiver Request at 2.



should not pose a significant a problem. Accordingly, we find that waiver of the rules is warranted under the terms and conditions set forth in the ordering clauses.

20. We are concerned that the aggregate PFD and EPFD could increase in the future if MDS Operations were permitted to deploy additional transmitting antennas with signals that overlap the area that receives a strong signal from the Sandia Park transmitter.<sup>65</sup> Accordingly, as a condition of the waiver allowing up to 22 dBm EIRP, we are requiring MDS Operations to obtain site-specific approval prior to operating any additional transmitting antenna within the area that receives a strong signal from the Sandia Park transmitting antenna.<sup>66</sup> The area subject to this “prior approval condition” is set forth in the ordering clauses and the area is shown generally in the Appendix. Additionally, while MVDDS licenses generally may be partitioned along county boundaries<sup>67</sup> and leased in any geographic area,<sup>68</sup> such partitioning or leasing could frustrate enforcement of this “prior approval condition.” Accordingly, the ordering clauses include a provision that prohibits MDS Operations from partitioning or leasing spectrum in two counties that have boundaries within the “prior-approval” area.

21. Granting a waiver to allow an EIRP level up to 22 dBm at the Sandia Park site requires an accompanying waiver of Section 101.105(a)(4)(i) of the Commission’s Rules, which limits the PFD level beyond 3 km from an MVDDS station to  $-135 \text{ dBW/m}^2$  in any 4 kHz measured and/or calculated at the surface of the earth.<sup>69</sup> The Commission adopted this PFD limit as a reasonable balance between limiting the potential for NGSO FSS receiver saturation or reliance on frequency diversity to relatively small and predictable areas while affording MVDDS operators benefit of the maximum 14 dBm EIRP in most instances.<sup>70</sup> That is, the general NGSO FSS saturation zone within 3 km of an existing MVDDS station is based on the 14 dBm EIRP limit. Permitting MDS Operations to operate the Sandia Park transmitting antenna at 22 dBm EIRP, pursuant to this *Order*, correlates to a potential saturation zone within 7.5 km of the Sandia Park site (in the direction of Albuquerque) for future NGSO FSS receivers operating in the 12.2-12.7 GHz band. In this regard, we find that granting MDS Operations a waiver of Section 101.105(a)(4)(i) to extend the “future NGSO impact zone” from a 3 km to a 7.5 km radius will not frustrate the underlying purpose of the rule because we are only granting a limited waiver that extends the “NGSO impact zone” in a very small area within the Albuquerque-Santa Fe MVD and therefore NGSO FSS receivers will not be precluded from operation in any significant area.<sup>71</sup>

#### IV. CONCLUSION AND ORDERING CLAUSES

22. We find, based on the circumstances presented in this proceeding, that limited waiver of the Multichannel Video Distribution and Data Service (MVDDS) technical rules is warranted to permit MDS Operations to operate a single MVDDS transmitting antenna at the Sandia Park site under Call Sign

<sup>65</sup> The Commission noted that the determination of MVDDS EPFD at a DBS subscriber location is dependent on many factors, including the location of the MVDDS transmitter, transmit and receive antenna gain patterns, MVDDS EIRP, and the relative height between the MVDDS transmitting antenna and the DBS receive antenna. *See Second R&O*, 17 FCC Rcd at 9654 ¶ 91 n.224.

<sup>66</sup> We note that this condition will provide stability to the RF environment that DBS operators will have to consider and mitigate when adding new subscribers and will also avoid a further potential expansion of the NGSO impact zone, which is discussed in the following paragraph, beyond 7.5 km.

<sup>67</sup> *See* 47 C.F.R. § 101.1415. MVDDS licenses can not be disaggregated. *Id.*

<sup>68</sup> *See* 47 C.F.R. § 1.9005(hh); *see also* 47 C.F.R. § 1.9003 (a spectrum leasing arrangement may involve the leasing of any amount of licensed spectrum, in any geographic area or site encompassed by the license).

<sup>69</sup> 47 C.F.R. § 101.105(a)(4)(i).

<sup>70</sup> *Second R&O*, 17 FCC Rcd at 9659 ¶ 112.

<sup>71</sup> *See, e.g., Second R&O*, 17 FCC Rcd at 9658-9659 ¶¶ 108-112.

WQAR561 in accordance with the terms and conditions set forth below.<sup>72</sup> We further find that the relief granted herein serves the public interest by promoting the development of MVDDS service.<sup>73</sup> Nonetheless, we reiterate that MDS Operations remains subject to all provisions of the Commission's Rules that have not explicitly been waived herein. In particular, MDS Operations must satisfy the DBS protection and other requirements of Section 101.1440 of the Commission Rules, 47 C.F.R. § 101.1440.<sup>74</sup>

23. Accordingly, IT IS ORDERED that, pursuant to Sections 4(i) and 309 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 309, and Sections 1.3 and 1.925 of the Commission's Rules, 47 C.F.R. §§ 1.3, 1.925, the Superseding Request for Waiver filed by MDS Operations, Inc. on June 25, 2009, IS GRANTED IN PART AND OTHERWISE DENIED.

24. IT IS FURTHER ORDERED that Sections 101.105(a)(4)(i), 101.113(a) note 11, and 101.147(p) of the Commission's Rules, 47 C.F.R. §§ 101.105(a)(4)(i), 101.113(a) note 11, 101.147(p), are WAIVED to authorize MDS Operations to operate a transmitting antenna at Sandia Park, New Mexico, with the following terms and conditions:

- MDS Operations must file an application requesting authorization for any facility that would have a significant environmental effect, as defined by §§ 1.1301 through 1.1319 of the Commission's Rules, 47 C.F.R. §§ 1.1301-1.1319, and nothing herein absolves MDS Operations from any obligations under Part 17 of the Commission's Rules (Construction, Marking, and Lighting of Antenna Structures), 47 C.F.R. §§ 17.1-17.58.
- The transmitting antenna shall be:
  - located within 50 meters of the following coordinates:  
35° 13' 01" North Lat. – 106° 27' 08" West Long. (the "Sandia Park site"),
  - with an effective isotropic radiated power (EIRP) not to exceed 22 dBm per 24 megahertz of spectrum,
  - with a sectored antenna with the main beam directed along a radial of 230 degrees from True North,
  - with a minus 4.5 degree physical beamtilt,
  - at a height no greater than 30 meters above the ground and 3269 meters above mean sea level.
- The sectored transmitting antenna shall have a horizontal and vertical port.
- If MDS Operations uses both horizontal and vertical polarizations, then the maximum power density allowed must be divided between the two polarizations such that the combined power density for both polarizations does not exceed 22 dBm per 24 megahertz of spectrum.

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<sup>72</sup> On April 21, 2009, MDS Operations separately filed requests seeking waiver and extension of time to demonstrate substantial service for 60 of its MVDDS licenses including call sign WQAR561. *See* MDS Operations, Inc., File No. 0003813916 (filed April 21, 2009). On June 10, 2009, the Bureau released a public notice seeking comment on extension requests filed by MDS Operations and other MVDDS licensees. DIRECTV and DISH Network submitted pleadings in response to the public notice. We do not address the extension request in the instant *Order*, and our action in this *Order* is subject to and without prejudice to Commission action on the extension requests.

<sup>73</sup> 47 C.F.R. § 1.925.

<sup>74</sup> Among other things, prior to operation under this waiver (or otherwise), MDS Operations must conduct a survey "to determine the location of all DBS customers of record that may potentially be affected," 47 C.F.R. § 101.1440(b), and must coordinate with DBS licensees as required by Section 101.1440(d). MDS America's experimental authority was conditioned on "prior coordination with DBS licensees in accordance with [Section] 101.1440." *See* File No. 0738-EX-ST-2005 (Experimental Special Temporary Authorization under Call Sign WC9XKW). DIRECTV essentially questions whether MDS America satisfied this condition. *See, e.g.,* DIRECTV Opposition at 18. We need not address whether MDS America satisfied the requirements of Section 101.1440 because the experimental authorizations have expired.

- The power flux density of the Sandia Park transmitting antenna must not exceed  $-135 \text{ dBW/m}^2$  in any 4 kHz band at a reference point at the surface of the earth at a distance greater than 7.5 kilometers from the Sandia Park site.
- For so long as MDS Operations elects to operate the transmitting antenna at the Sandia Park site at an EIRP that exceeds 14 dBm per 24 megahertz of spectrum as permitted by the instant *Order*:
  - MDS Operations shall not deploy any additional transmitting antennas (including facilities that meet the Commission's Rules) in the Albuquerque-Santa Fe MVD located less than 30 km (18.6 miles) from the Sandia Park site between the radials 180° and 290° from True North (the "prior-approval area") without applying for and obtaining prior site-specific authority from the Commission,
  - MDS Operations shall not partition or lease any portion of its license within the prior approval area, including the following areas: Bernalillo County, New Mexico, and Sandoval County, New Mexico.
- MDS Operations shall notify the Commission in the event that it no longer wishes to operate the transmitting antenna at the Sandia Park site at an EIRP that exceeds 14 dBm per 24 megahertz of spectrum as permitted by the instant *Order*.

25. IT IS FURTHER ORDERED that, pursuant to Sections 4(i) and 309 of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Sections 1.3 and 1.925 of the Commission's Rules, 47 C.F.R. §§ 1.3, 1.925, that the licensing staff of the Broadband Division SHALL UPDATE Call Sign WQAR561 in accordance with this *Order*.

26. These actions are taken under delegated authority pursuant to Sections 0.131 and 0.331 of the Commission's Rules, 47 C.F.R. §§ 0.131, 0.331.

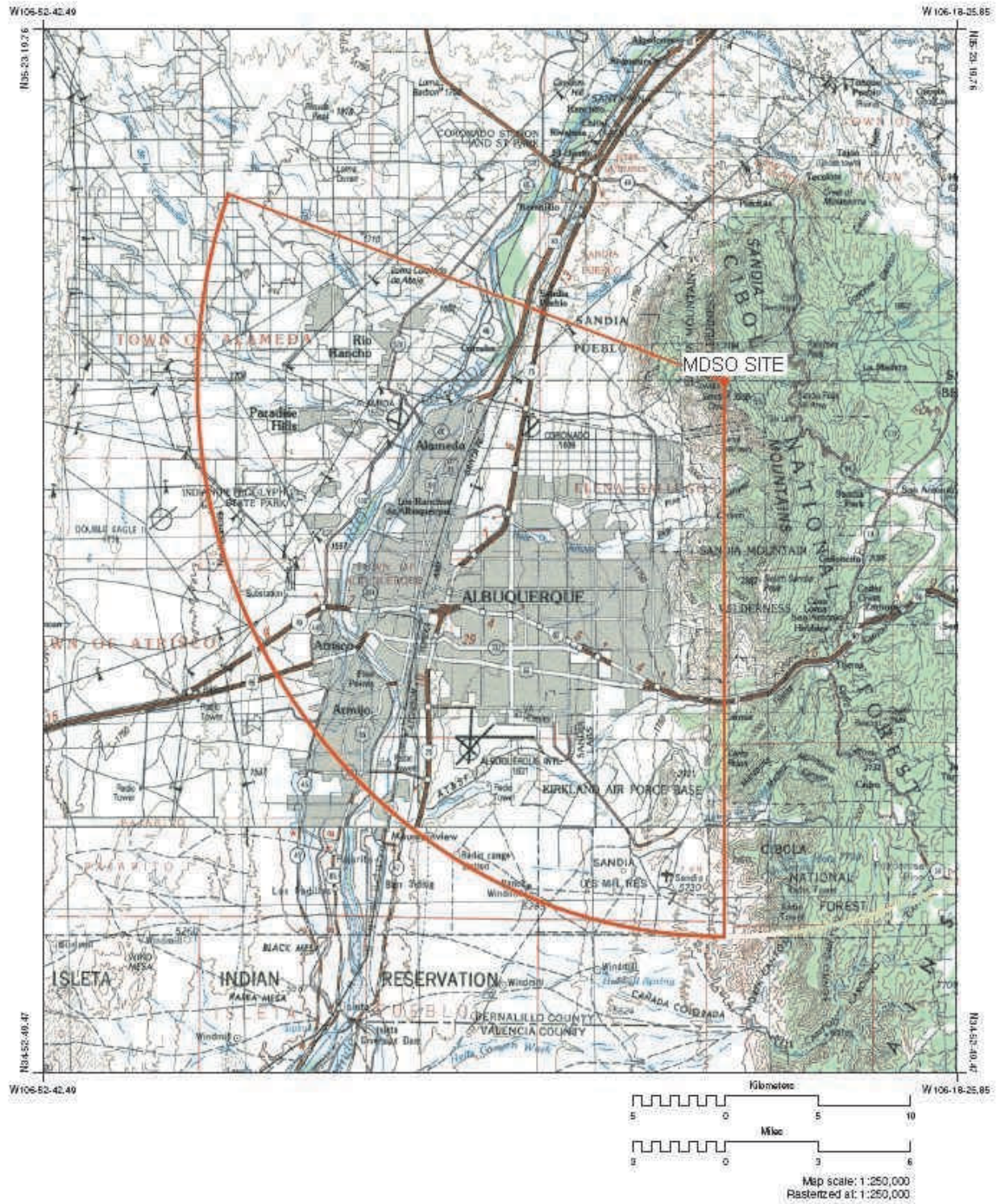
FEDERAL COMMUNICATIONS COMMISSION

Ruth Milkman  
Chief, Wireless Telecommunications Bureau



## APPENDIX

### Prior-approval Area



MDSO site = "Sandia Park site"